Insurance Portfolio Management

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Insurance Policies

Example

Insurance Portfolio Management

Insurance portfolio management (IPM) is the process of managing *overlapping insurance policies* with an eye to *minimizing insurance costs* while *ensuring adequate coverage*.

Complexity of Insurance Policies

Policies are complex, incomplete, inconsistent.

CodeX Insurance Analyst

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Sign Out

Products
Click on the link to **view** available insurance products.

People
Click on the link to **view** or **add** people you would like to include on your policies.

Policies
Click on the link to **view**, **add**, or **analyze** policies.

Properties
Click on the link to **view** or **add** properties that are insured or that you wish to insure (automobiles, houses, etc.).

Claims
Click on the link to **view**, **add**, or **analyze** claims.

Events
Click on the link to **view** recorded events (accidents, fires, etc.) or to **record** new events.

Feedback

Products   Policies   Claims   People   Properties   Events

Product	Insurer	Actions
aflac_hospital_cash	aflac	
axa_travel_policy	axa	
calcas_auto_insurance	calcas	
chubb_hospital_cash	chubb	
codex_plana	codex	
codex_planb	codex	
codex_planc	codex	
codex_pland	codex	
codex_plane	codex	
codex_planf	codex	
codex_plang	codex	
codex_planh	codex	
hertz_rental_insurance	hertz	
lifesecure_hospital_cash	lifesecure	
visa_signature	visa	

Feedback

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Products	Policies	Claims	People	Properties	Events

Policies

Policy	Insurer	Type	Insuree	Begin	End	Actions
policy1234567821	chubb	chubb_hospital_cash	steve_squirrel	2021_01_01	2021_12_31	📄🔍🗑
policy1234567822	axa	axa_travel_policy	sally_squirrel	2021_01_01	2021_12_31	📄🔍🗑
policy1234567831	codex	codex_plana	steve_squirrel	2021_01_01	2021_12_31	📄🔍🗑
policy1234567832	codex	codex_planb	steve_squirrel	2021_01_01	2021_12_31	📄🔍🗑
policy1234567833	codex	codex_planc	steve_squirrel	2021_01_01	2021_12_31	📄🔍🗑
policy1234567834	codex	codex_pland	steve_squirrel	2021_01_01	2021_12_31	📄🔍🗑
policy1234567841	visa	visa_signature	sally_squirrel	2021_01_01	2021_12_31	📄🔍🗑

Add Policy

Feedback

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Products   Policies   Claims   People   Properties   Events

Claims			
Claim	**Event**	**Recommendation**	**Justification**
claim21	hospitalization21	decline	Explain
claim22	hospitalization22	pay	Explain
claim31	repair31	pay	Explain
	Add Hospitalization Add Repair		

Feedback

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Products   Policies   Claims   People   Properties   Events

Claim Information

Claim: [claim21 ⇕] [New]
Event: [hospitalization21 ⇕] [New]
Date: 2021_11_30

Hospitalization Detail

Patient: [sally_squirrel ⇕]   Diagnosis: [sprained_ankle ⇕]
Hospital: [Johns Hopkins Medical Center ⇕]   Physician: [Dr. Kildare ⇕]
Date Admitted: 2021_08_23   Time Admitted: [10:00 pm ⇕]
Date Discharged: 2021_08_24   Time Discharged: [10:00 am ⇕]
WARNING: Your hospital stay was less than 24 hours. You will not be covered for this claim.
Was hospitalization recommended by a practicing physician? [Yes ⇕]
What was the cause of the condition requiring hospitalization? [accident21 ⇕] [New]

Accident Information

Id: accident21
Subject: [sally_squirrel ⇕]
Activity: [Dancing ⇕]
Country: [usa ⇕]
Date: 2021_08_23

[Load]   [Save]

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Products   Policies   Claims   People   Properties   Events

Claim Information

Claim: [claim21 ⇕] [New]
Event: [hospitalization21 ⇕] [New]
Date: 2021_11_30

Hospitalization Detail

Patient: [sally_squirrel ⇕] Diagnosis: [sprained_ankle ⇕]
Hospital: [Johns Hopkins Medical Center ⇕] Physician: [Dr. Kildare ⇕]
Date Admitted: 2021_08_23   Time Admitted: [10:00 pm ⇕]
Date Discharged: 2021_08_24   Time Discharged: [10:00 pm ⇕]
Was hospitalization recommended by a practicing physician? [Yes ⇕]
What was the cause of the condition requiring hospitalization? [accident21 ⇕] [New]

Accident Information

Id: accident21
Subject: [sally_squirrel ⇕]
Activity: [Dancing ⇕]
Country: [usa ⇕]
Date: 2021_08_23

[Load] [Save]

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Products   Policies   **Claims**   People   Properties   Events

Claim Information

Claim: [claim21 ⏷] [New]
Event: [hospitalization21 ⏷] [New]
Date: 2021_11_30

Hospitalization Detail

Patient: [sally_squirrel ⏷] Diagnosis: [sprained_ankle ⏷]
Hospital: [Johns Hopkins Medical Center ⏷] Physician: [Dr. Kildare ⏷]
Date Admitted: 2021_08_23   Time Admitted: [10:00 pm ⏷]
Date Discharged: 2021_08_24   Time Discharged: [10:00 pm ⏷]
Was hospitalization recommended by a practicing physician? [Yes ⏷]
What was the cause of the condition requiring hospitalization? [accident21 ⏷] [New]

Accident Information

Id: accident21
Subject: [sally_squirrel ⏷]
Activity: [Skydiving ⏷]
WARNING: Your accident is due to an extreme activity. You will not be covered for this claim.
Country: [usa ⏷]
Date: 2021_08_23

[Load] [Save]

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Products	Policies	Claims	People	Properties	Events

Policies

Policy	Insurer	Type	Insuree	Begin	End	Actions
policy1234567821	chubb	chubb_hospital_cash	steve_squirrel	2021_01_01	2021_12_31	🔍🗑
policy1234567822	axa	axa_travel_policy	sally_squirrel	2021_01_01	2021_12_31	🔍🗑
policy1234567831	codex	codex_plana	steve_squirrel	2021_01_01	2021_12_31	🔍🗑
policy1234567832	codex	codex_planb	steve_squirrel	2021_01_01	2021_12_31	🔍🗑
policy1234567833	codex	codex_planc	steve_squirrel	2021_01_01	2021_12_31	🔍🗑
policy1234567834	codex	codex_pland	steve_squirrel	2021_01_01	2021_12_31	🔍🗑
policy1234567841	visa	visa_signature	sally_squirrel	2021_01_01	2021_12_31	🔍🗑
					Add Policy	

Feedback

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| Products | Policies | Claims | People | Properties | Events |

Policies

	Policy	Insurer	Type	Insuree	Begin	End	Actions
☐	policy1234567821	chubb	chubb_hospital_cash	steve_squirrel	2021_01_01	2021_12_31	📄🔍
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☐	policy1234567833	codex	codex_planc	steve_squirrel	2021_01_01	2021_12_31	📄🔍
☐	policy1234567834	codex	codex_pland	steve_squirrel	2021_01_01	2021_12_31	📄🔍
☐	policy1234567841	visa	visa_signature	sally_squirrel	2021_01_01	2021_12_31	📄🔍

Provisions

```
covers(policy1234567831,Z) :-
    hospitalization.patient(Z,steve_squirrel) &
    hospitalization.hospital(Z,V72) &
    hospital.country(V72,usa) &
    hospitalization.startdate(Z,V73) &
    hospitalization.enddate(Z,V74)
```

```
covers(policy1234567831,Z) :-
    hospitalization.patient(Z,V80) &
    person.spouse(V80,steve_squirrel) &
    hospitalization.hospital(Z,V81) &
    hospital.country(V81,usa) &
    hospitalization.startdate(Z,V82) &
    hospitalization.enddate(Z,V83)
```

```
covers(policy1234567831,Z) :-
    hospitalization.patient(Z,V89) &
    person.parent(V89,steve_squirrel) &
    hospitalization.hospital(Z,V90) &
    hospital.country(V90,usa) &
    hospitalization.startdate(Z,V91) &
    hospitalization.enddate(Z,V92)
```

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Products	Policies	Claims	People	Properties	Events

Policies

	Policy	Insurer	Type	Insuree	Begin	End	Actions
☐	policy1234567821	chubb	chubb_hospital_cash	steve_squirrel	2021_01_01	2021_12_31	📄🔍
☐	policy1234567822	axa	axa_travel_policy	sally_squirrel	2021_01_01	2021_12_31	📄🔍
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Provisions

✓
```
covers(policy1234567831,Z) :-
    hospitalization.patient(Z,steve_squirrel) &
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```

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covers(policy1234567831,Z) :-
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    hospital.country(V81,usa) &
    hospitalization.startdate(Z,V82) &
    hospitalization.enddate(Z,V83)
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covers(policy1234567831,Z) :-
    hospitalization.patient(Z,V89) &
    person.parent(V89,steve_squirrel) &
    hospitalization.hospital(Z,V90) &
    hospital.country(V90,usa) &
    hospitalization.startdate(Z,V91) &
    hospitalization.enddate(Z,V92)
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| Products | Policies | Claims | People | Properties | Events |

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Provisions

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Policies

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☐	policy1234567834	codex	codex_pland	steve_squirrel	2021_01_01	2021_12_31	📄🔍
☐	policy1234567841	visa	visa_signature	sally_squirrel	2021_01_01	2021_12_31	📄🔍
☐	policy1677517451	codex	codex_planh	steve_squirrel	2021_01_01	2021_12_31	📄🔍

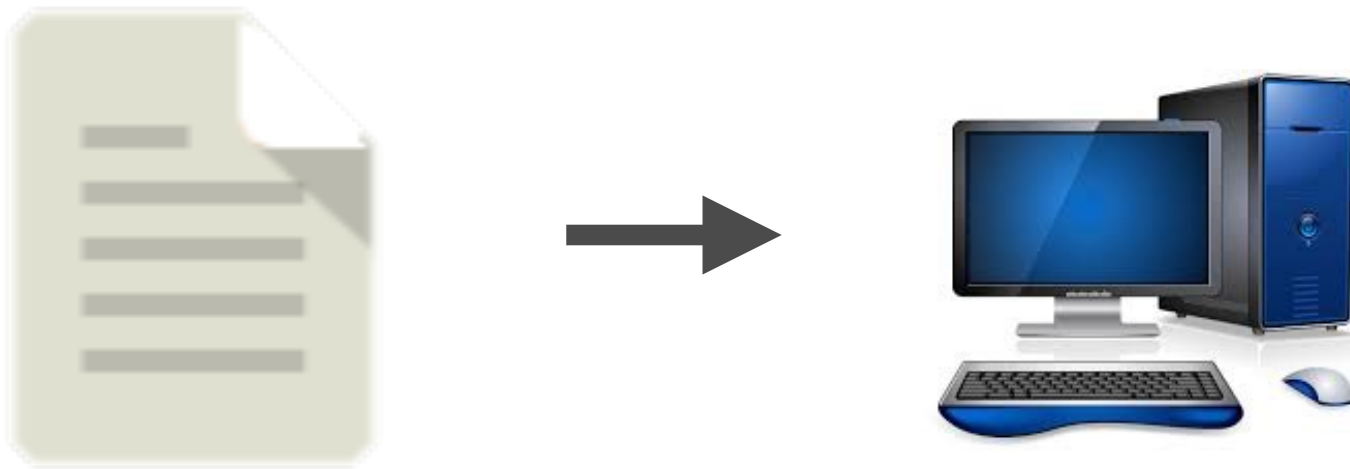## Provisions

```
covers(policy1234567841,Z) :-
    repair.vehicle(Z,v1234) &
    collision.vehicle(V166,v1234) &
    collision.country(V166,usa)
```

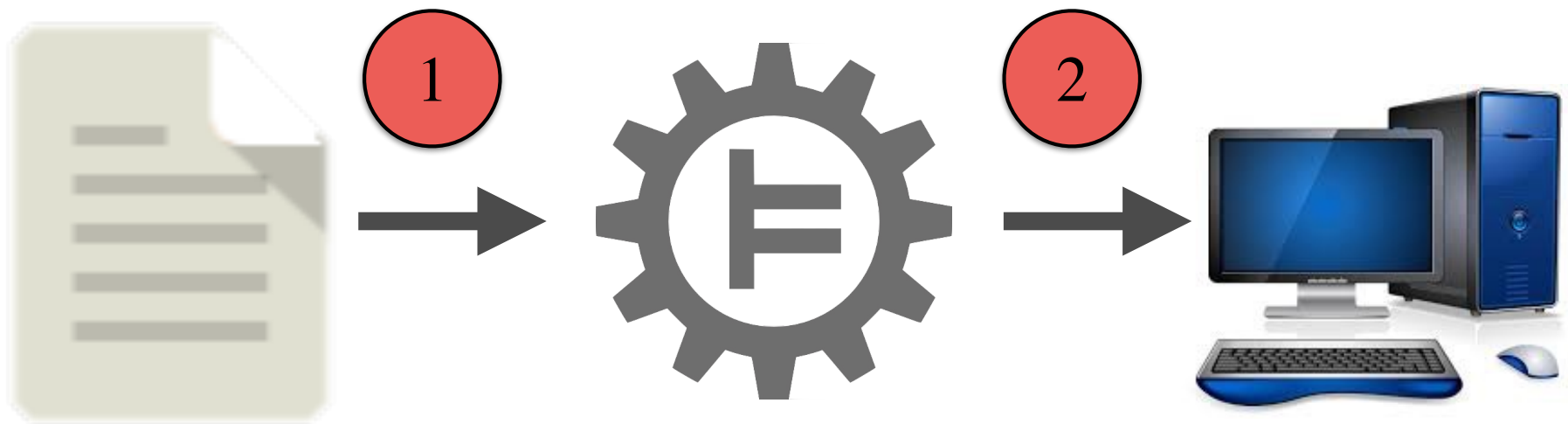Feedback

From Policies to Automated Analysis

Computable Contracts

From Text to Computable Contracts to Automation

Contract Definition Language (CDL)

View Definition Language (Epilog)
terms of coverage in terms of domain concepts
definitions of concepts in terms of available data
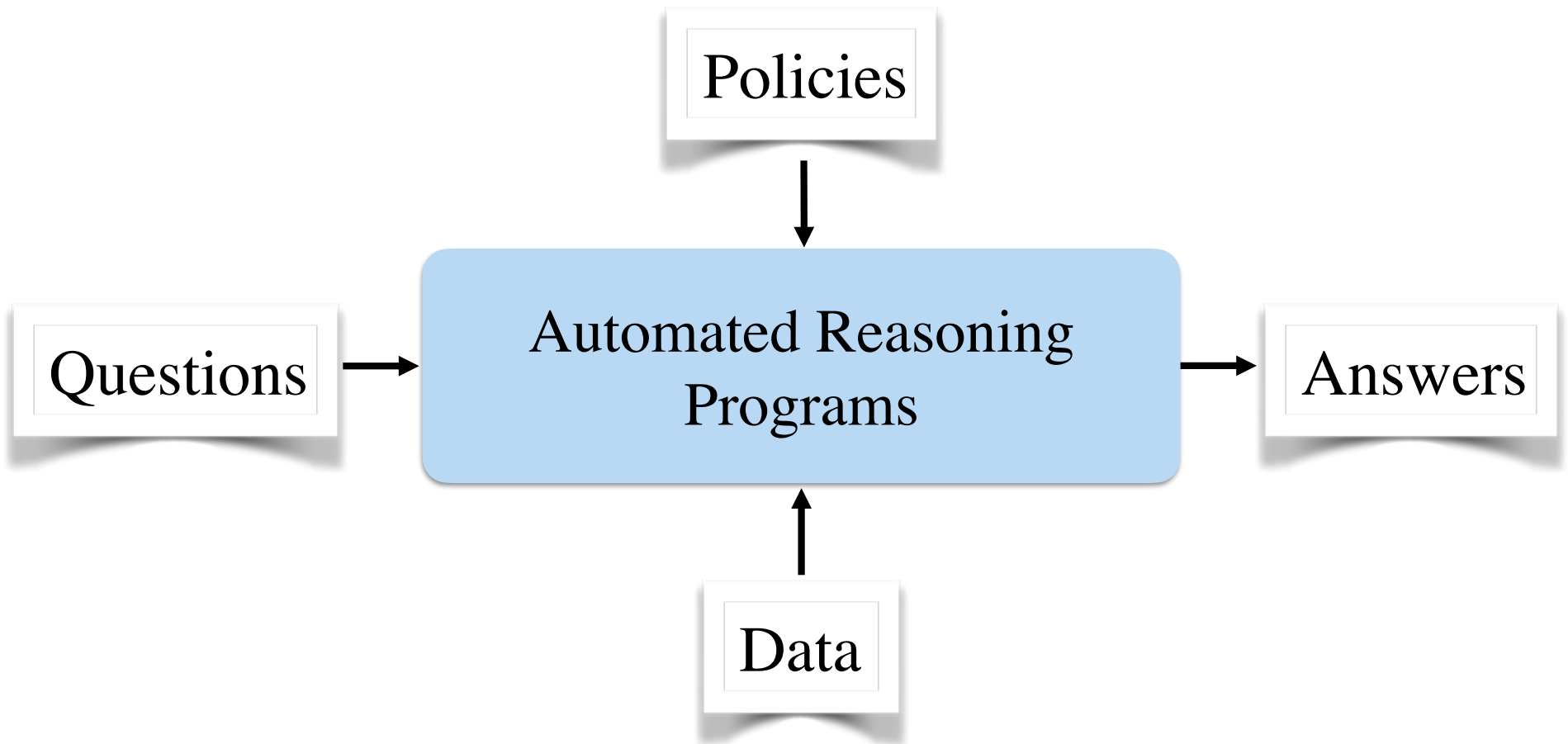
Contract / Insurance Ontology (in progress)
offer, acceptance, consideration, etc.
premiums, claims, claim lines, deductibles, exclusions

Domain Ontology and Data (in progress)
e.g. diseases, drugs, medical procedures, etc.
e.g. fenders, radiators, repair procedures, etc.
e.g. walls, external water, internal water, etc.

Automated Reasoning Programs

Contractnet

Background Datasets
  Geography
  Hospitals

Background Rulesets
  e.g. a week is 7 days
  e.g. parents are older than their children

Open-Source Contract Processing Software
  Compliance checking (EpilogJS)
  Explaining contractual analysis (ExplainJS, EnglishJS)
  User Worksheets (WorksheetsJS)
  Containment Testing and Configuration Aids (CheckJS)

  Github for Computable Insurance Contract Software

CodeX Insurance Analyst
for Businesses

Products

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People

Click on the link to **view** or **add** people you would like to include on your policies.

Policies

Click on the link to **view**, **add**, or **analyze** policies.

Properties

Click on the link to **view** or **add** properties that are insured or that you wish to insure (automobiles, houses, etc.).

Claims

Click on the link to **view**, **add**, or **analyze** claims.

Events

Click on the link to **view** recorded events (accidents, fires, etc.) or to **record** new events.

Feedback

CodeX Insurance Analyst
for Insurance Companies

Products
Click on the link to **view** available insurance products.

People
Click on the link to **view** or **add** people you would like to include on your policies.

Policies
Click on the link to **view**, **add**, or **analyze** policies.

Properties
Click on the link to **view** or **add** properties that are insured or that you wish to insure (automobiles, houses, etc.).

Claims
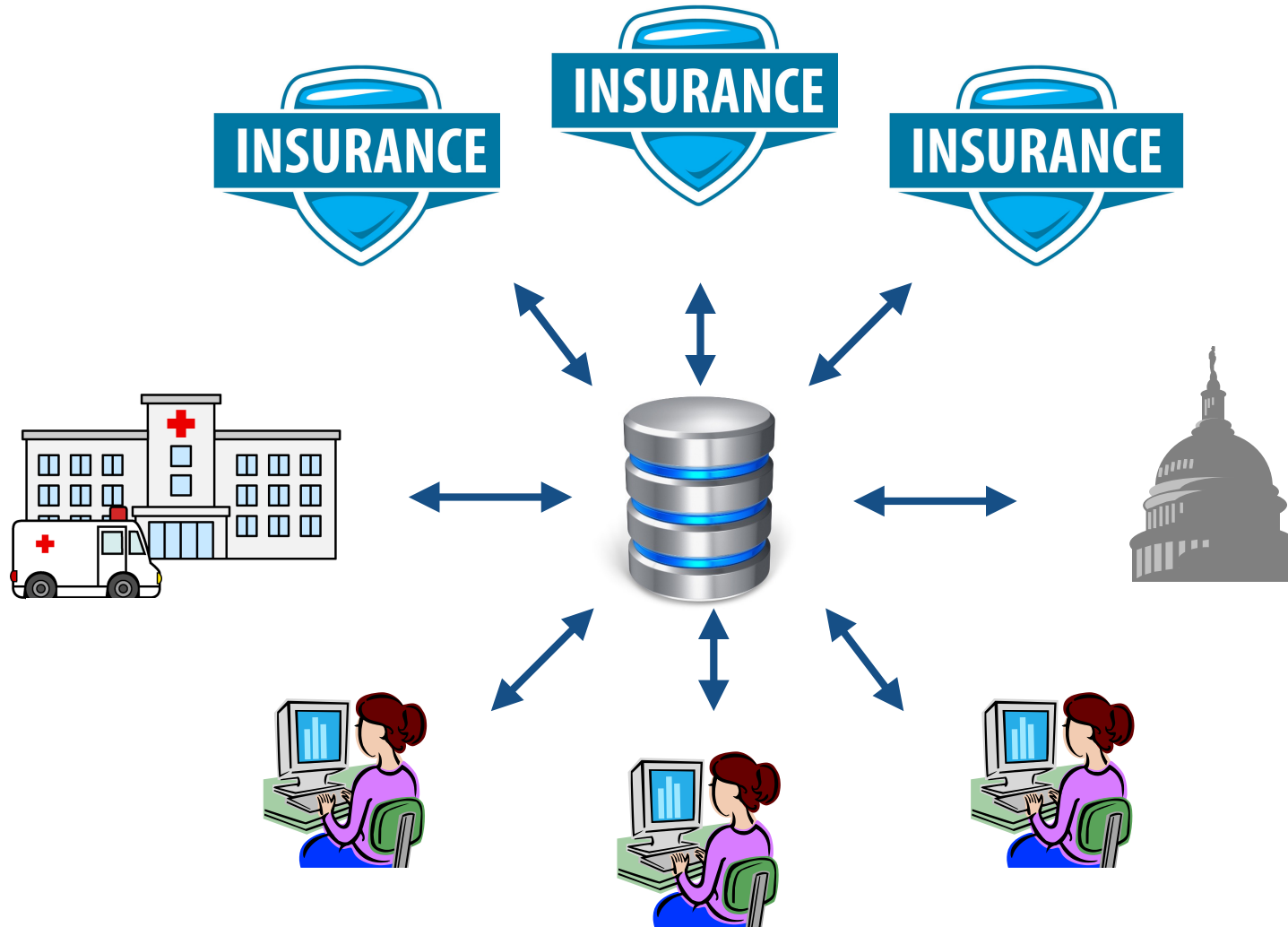Click on the link to **view**, **add**, or **analyze** claims.

Events
Click on the link to **view** recorded events (accidents, fires, etc.) or to **record** new events.

Feedback

CodeX Insurance Ecosystem

CODEX

The Stanford Center for Legal Informatics

Legal Empowerment through Information Technology